BRANFORD HARBOR

CONNECTICUT

SURVEY

REVIEW OF REPORTS

CORPS OF ENGINEERS, U. S. ARMY
OFFICE OF THE DIVISION ENGINEER
NEW ENGLAND DIVISION, BOSTON, MASS.

FEBRUARY 24, 1956

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ARMY-NED-COSTON

NOT FOR PUBLIC RELEASE

SURVEY (REVIEW OF REPORTS)

BRANFORD HARBOR
CONNECTICUT

SYLLABUS

The Division Engineer finds that the desired deepening of the existing channel from 8.5 feet to 12 feet, estimated to cost $323,000, would not provide benefits commensurate with the cost. The improvements requested for recreational craft have been provided by local interests. He, therefore, recommends that no modification to the existing project be made at this time.

TABLE OF CONTENTS

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DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
OFFICE OF THE DIVISION ENGINEER
NEW ENGLAND DIVISION
BOSTON, MASS.

NEDGW 24 February 1956

SUBJECT: Survey (Review of Reports) on Branford Harbor, Connecticut

TO: Chief of Engineers, Department of the Army, Washington 25, D. C.

AUTHORITY

1. This report of survey of Branford Harbor, Connecticut, is in review of previous reports, and is submitted in compliance with a Resolution adopted October 10, 1945, by the Committee on Commerce of the United States Senate:

> "RESOLVED BY THE COMMITTEE ON COMMERCE OF THE UNITED STATES SENATE, that the Board of Engineers for Rivers and Harbors, created under Section 3 of the River and Harbor Act, approved June 13, 1902, be, and is hereby, requested to review the report on Branford Harbor, Connecticut, contained in House Document numbered 1292, Sixty-fourth Congress, First Session, and other reports, with a view of determining whether the project should be modified in any way at this time."

SCOPE OF SURVEY

2. A review report of survey scope was authorized October 23, 1945, by the Chief of Engineers. For the purpose of this report a hydrographic survey of the proposed site of the anchorage basin and of prospective spoil areas was made. Other data was obtained from surveys of the harbor and river made in connection with maintenance dredging operations, as a result of a public hearing, and from local interests.

3. The report under review is a survey report completed in 1916. It considered the advisability of providing a channel 12 feet deep at mean low water through the inner harbor and river and a breakwater to protect the entrance channel. The Chief of Engineers reported that no additional improvement of Branford Harbor was advisable at that time and recommended that a depth not exceeding 7.5 feet at mean low water be maintained in the channel through the shoals in the inner harbor. No change was recommended in the 8.5-foot project depth in the river. Congress has taken no action on this report.

DESCRIPTION

4. Branford Harbor lies on the north shore of Long Island Sound about five miles east of New Haven Harbor. The entrance to the harbor is almost one mile wide. The harbor extends inland about one mile, narrowing at the inner end to a width of less than one-half mile. A line between Lovers Island and Indian Neck Point separates the outer and inner harbors. The outer harbor is flat with depths ranging generally from 9 to 14 feet. The inner harbor has depths generally less than eight feet and is broken by numerous rocky shoals and islands. A dredged channel 8.5 feet deep extends through the inner harbor to Branford Point. The harbor offers good shelter from northerly storms but is exposed to storms from the south.

5. Branford River, a small tidal stream, enters the inner harbor at Branford Point. It is about 500 feet wide at its mouth and thence to the head of navigation at the upper wharf varies from 2,000 to 200 feet in width. An 8.5-foot dredged channel leads through the upper river between the lower and upper wharves to the Town highway bridge just above the upper wharf. The mean tidal range is 5.9 feet. Branford Harbor is shown on United States Coast and Geodetic Chart No. 217 and on the map accompanying this report.

TRIBUTARY AREA

6. The area tributary to the harbor consists of the Town of Branford with a population in 1950 of about 10,944, a grand list of $19,159,874 and a net indebtedness of $498,000. The principal industries are farming, fishing, quarrying and the manufacture of malleable iron products. The service of summer visitors plays an important part in the economic life of the community. Many summer homes are situated on the shores of the harbor. Excellent transportation facilities exist and good roads prevail throughout the area. The main line of the New York, New Haven and Hartford Railroad passes through Branford, and bus service to New Haven provides convenient connection with all New York and Boston trains.

BRIDGES

7. No bridges cross any portion of the improved waterway. The head of the improved channel is situated at a Town-owned highway bridge just above the upper wharf. This bridge was constructed in 1938 under plans approved by the Secretary of War as a fixed span with provision for conversion to a drawspan.

PRIOR REPORTS

8. Branford Harbor has been the subject of three survey reports, and also three preliminary examinations which did not result in surveys, all as listed in the following tabulation:

Prior Reports on Branford Harbor

Year	Nature, Portion Considered and Recommendation	Published in
1883	Survey of harbor and river channels, unfavorable.	S. Ex. Doc. No. 50, 48th Cong., 1st sess. Ann. Rept. C. of E. 1884, p. 679.
1900	Survey of harbor and river channel and breakwater, favorable to 8.5-foot river channel. Basis of existing project.	H. Doc. No. 100, 56th Cong., 2d sess. Ann. Rept. C. of E. 1901, p. 1188.
1907	Preliminary examination of harbor and river channel, unfavorable to 12.5-foot channel.	H. Doc. No. 80, 60th Cong., 1st sess.
1916	Survey of harbor and river channel and breakwater, unfavorable to 12-foot channel. Recommended maintenance in channel through harbor shoals not to exceed 7.5 feet.	H. Doc. No. 1292, 64th Cong., 1st sess.
1931	Preliminary examination of harbor and river channel, unfavorable to 12-foot channel.	Not published.
1936	Preliminary report on breakwater and anchorage basin, unfavorable.	Not published.

EXISTING CORPS OF ENGINEERS PROJECT

9. There was no Federal improvement prior to the adoption of the existing project in 1902, when a channel 8½ feet deep at mean low water and 100 feet wide in the upper river was authorized. The River and Harbor Act approved March 2, 1907, authorized continuation of the channel with the same dimensions "through the shoals at its outer end to deep water in the outer channel". The existing project thus provides for a channel 8½ feet deep and 100 feet wide from that depth in the outer harbor to the upper wharf in the river. This project was completed in 1907 at a cost of $9,537 for new work. Project dimensions were last restored in April 1946 and maintenance dredging is scheduled for completion by June 30, 1956. The latest approved estimate (1950) for annual cost of maintenance is $5,000. Expenditures for operations and maintenance amounted to $120,930 up to June 30, 1955. The amount of $140,000 has been provided for the maintenance dredging scheduled during F.Y. 1956. No action has been taken by Congress on the 1916 recommendation by the Chief of Engineers that the channel through the shoals in the inner harbor be maintained at a depth not exceeding 7.5 feet.

LOCAL COOPERATION AND OTHER IMPROVEMENTS

10. No conditions of local cooperation have been prescribed by law. The Malleable Iron Fittings Company has expended over $24,000 in periodic dredging of its berth and the adjacent section of the channel in the upper river. A depth of 12 feet at mean low water was maintained in its berth in 1942. Some widening of the bends in the lower river has been accomplished also. This same company expended $30,000 in 1938 in additions and improvements to its wharfage facilities. The Town of Branford constructed a free public wharf at Branford Point in 1928. The cost of this work is unknown. The Branford Yacht Club has constructed a marina with finger piers for recreational craft, and has dredged a basin adjacent to the shore facilities. No other improvements benefiting general navigation have been reported.

TERMINAL AND TRANSFER FACILITIES

11. There are two commercial wharves in the upper river. The largest is owned by the Malleable Iron Fittings Company. It is of solid fill construction with pile and timber apron and has a total length of 680 feet with depths of four to nine feet alongside. The Branford Coal and Lumber Company owns a solid fill wharf about 130 feet long. This wharf was used in the past for the receipt of coal and lumber and the shipment of stone from nearby quarries. Both wharves are open to the public at the owner's convenience. Existing commercial facilities are adequate for existing and prospective commerce.

12. At Branford Point, the Town of Branford maintains a free public wharf. It is 93 feet long, of pile and timber construction. Depths alongside average six feet. The wharf was repaired in 1951 and is used by transient pleasure craft and fishing vessels. The Branford Yacht Club operates a marina with docking space for over 300 pleasure craft. This marina is situated north of the channel just east of the Town wharf. Several boatyards are situated in the inner harbor and upper river. These yards build, service, repair, and store pleasure craft. Additional winter storage space is needed and construction of additional facilities for pleasure craft is planned by local interests. There are numberous small private piers situated on the shores of the harbor that are not open to the public.

IMPROVEMENT DESIRED

13. A public hearing held at Branford, Connecticut, on December 13, 1945, was attended by State and Town officials, a representative of a towboat association, businessmen, and officers of the Branford Yacht Club. The Malleable Iron Fittings Company, the principal

freight receiver on the river, requested that a channel 12 feet deep at mean low water and 100 feet wide be provided from deep water in Branford Outer Harbor to the present head of navigation. The Branford Yacht Club, representing pleasure boat interests, requested the dredging of an anchorage basin 250 feet wide, about 1,200 feet long and six feet deep at mean low water adjacent to the Town wharf at Branford Point.

14. In justification of the desired 12-foot channel, the spokesman for the Malleable Iron Fittings Company stated that substantial transportation savings would accrue to the company if a 12-foot depth were provided. Slight relocation of the existing channel at the upper wharf would provide additional benefits to the company through elimination of the need for frequent dredging alongside the wharf. The spokesman for a towboat association discussed the difficulties encountered in traversing the unimproved portion of the river between the project channels of the Inner Harbor and Upper River. He stated that the natural channel was so narrow in places as to seriously endanger existing traffic.

15. Pleasure craft interests cited the inconveniences to pleasure boating due to lack of depth in the existing protected anchorage area. It was stated that development of recreational use of Branford Harbor was being hampered thereby. The yacht club spokesman expressed the opinion that an increase in anchorage area would result in immediate increased use of the waterway by pleasure craft.

16. In the matter of local cooperation, the Malleable Iron Fittings Company offered to contribute to the project if the upper channel section was moved closer to its wharf. A local boatyard owner offered a spoil disposal area. It was indicated that other spoil areas would be made available. No indication was given of the willingness of local interests to contribute toward the cost of the anchorage.

17. In September 1955, a trustee of the Branford Yacht Club stated that since 1946 the yacht club and other interests had built marinas and made improvements for recreational craft so that modification of the existing Branford Harbor project to provide anchorage space for recreational craft was no longer needed. He stated that the need of all concerned would be adequately met at this time by maintenance of the existing project.

18. In October 1955, the Malleable Iron Fittings Company and the First Selectman of the Town of Branford were requested to comment on the present attitude of local interests toward modification of the project. No replies have been received.

COMMERCE

19. The commerce of Branford Harbor showed only slight variations between 1941 and 1945, averaging about 6,000 tons annually. Prior to the war, water-borne coal was received. For ten years prior to the war, water-borne commerce averaged about 12,700 tons annually. Since 1945, commerce has decreased and no receipts or shipments have been reported since 1949. The cessation of receipts is partly due to shoaling and the difficulty of traversing the channel. The following table shows the tonnages and commodities handled during the past ten years, all of which were received by the Malleable Iron Fittings Company.

Commerce - Branford Harbor, Connecticut
Receipts in short tons

Commodity	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954
Bituminous Coal	-	-	953	-	-	-	-	-	-	-
Molding sand	4230	3593	2056	3264	-	-	-	-	-	-
Pig Iron	2205	686	-	-	-	-	-	-	-	-
Totals	6435	4279	3009	3264	None	None	None	None	None	None

In addition to the above, a small quantity of fish and shellfish is landed at the Town wharf. No data are available on the tonnage involved.

20. In addition to molding sand and pig iron, the principal receiver stated in 1945 that plans were being made to receive by water about 9,800 tons of bituminous coal and core sand annually if a 12-foot channel were provided through the harbor and river. Whether other commerce would develop is purely conjectural. Petroleum products can be received economically by water, providing adequate storage facilities are developed. The proximity of New Haven Harbor would probably preclude the possibility of any large petroleum development on the Branford River. Any storage facilities which might be developed would probably be used to store petroleum solely for local consumption.

VESSEL TRAFFIC

21. There has been no commercial traffic reported since 1948. The harbor and river are used by a number of fishing and pleasure craft. The local pleasure craft fleet numbers over 300 boats. No record is available of the number of trips made by either pleasure or fishing craft.

DIFFICULTIES ATTENDING NAVIGATION

22. The principal difficulty attending navigation as reported at the public hearing is the lack of width in the natural river channel between the lower and upper improved sections. Lack of depth throughout

the channel would require tidal operation of barges and towboats. Use of the river by the Malleable Iron Fittings Company ceased in 1948, partially due to these difficulties. Local recreational interests have indicated that the project would be adequate for small craft if maintained at project depth.

WATER POWER AND OTHER SPECIAL SUBJECTS

23. Questions of water power and flood protection are not pertinent to this report. Disposal of dredged material hydraulically would result in the reclamation of some marsh land and make additional waterfront property available for commercial or other use. There are no cultivated oyster beds near enough to the sites of the desired improvements to be affected by dredging operations.

PLAN OF IMPROVEMENT

24. The improvement desired and considered in this report is deepening of the existing 8.5-foot project channel to 12 feet, with a slight realignment to bring the channel closer to the Malleable Iron Fittings Company wharf at the head of the project. The anchorage for recreational craft has been provided by local interests.

AIDS TO NAVIGATION

25. The United States Coast Guard has furnished an estimate for additional aids to navigation that would be required for a 12-foot channel. The additional aids needed could be provided at a first cost of $5,000 (1955) and an additional $1,000 annually would be needed for maintenance.

SHORE LINE EFFECTS

26. Deepening the existing project channel to 12 feet would have no effect on the adjacent shore line. Adjacent marsh lands have been used as spoil areas during maintenance dredging without effect on the shore line, and it is not anticipated that spoil disposal on the marsh land would cause any major problems.

ESTIMATE OF FIRST COST

27. An estimate has been made of the cost of the desired 12-foot channel based on hydraulic dredging and current prices. An allowance for one foot of overdepth is included in the estimate of materials to be removed.

Dredging 250,000 cubic yards of mud and sand at $1.00/c.y.	$250,000
Contingencies	38,000
Engineering and Design	8,000
Supervision and Administration	22,000
	$318,000
Additional Aids to Navigation (U. S. Coast Guard)	5,000
TOTAL COST (December 1955)	$323,000

ESTIMATE OF ANNUAL CHARGES

28. Annual charges have been computed using an interest rate of 2½ percent and a useful project life of 50 years. Estimated annual charges for the 12-foot channel are summarized below:

Interest and Amortization	$11,400
Additional Annual Maintenance - Channel	1,000
Aids to Navigation	1,000
TOTAL ANNUAL CHARGES	$13,400

ESTIMATE OF BENEFITS

29. The Malleable Iron Fittings Company presented data at the hearing in 1945 to show the need for a 12-foot channel. It was stated that the company had received an average of 9,700 tons of pig iron and sand annually by barge, and would receive an additional 9,800 tons of bituminous coal by barge if the 12-foot channel were constructed. The coal then received by rail would be brought by barge from New Jersey ports at a saving to the company of $0.60/ton in transportation costs, and $0.255/ton in handling charges, a total of $8,390 annually. In addition, the relocation of the channel closer to their wharf would eliminate a maintenance dredging expense estimated to be $1,180 annually.

30. Since 1948, the company has received all of its raw material by rail or truck because of shoaling of the channel. Maintenance dredging of the existing 8.5-foot project is now underway, and it is presumed that the company will again receive about 9,700 tons of pig iron and sand annually by barge. This commerce represents about 12 trips per year by the 800-ton barges previously used. As the tugs that bring these barges draw about 12 feet, there would be a tidal delay averaging four hours per trip in the 8.5-foot channel. The current operating expense of a tug and barge is $22 an hour, so that the annual tidal delay expense in the 8.5-foot channel would be about $1,000.

31. The total benefits from deepening the channel from 8.5 to 12 feet would be about $10,600 if the company resumed receipt of pig iron and sand by barge, realized a saving of $0.855/ton on shipments of coal, and could eliminate maintenance dredging between its wharf and the channel. However, it is doubtful that the company would receive coal by barge. An investigation of freight rates indicates that the cost of rail transportation of coal from the mines to Branford is $4.51/ton and the rate by barge is about $4.65/ton. As the handling charge at the plant would be almost equal for each method of transportation, it does not appear that the present method of shipment would be changed. The study also indicated that New Haven Harbor, seven miles from Branford by highway, is the largest coal receiving port in Connecticut, and railroad rates for bulk coal shipments to Branford are competitive with the rates for shipment by collier to New Haven and rail or truck to Branford.

32. The total benefits from deepening the channel to 12 feet are estimated to be about $2,200 if the company did not receive coal by barge.

COMPARISON OF BENEFITS AND COSTS

33. The benefits, annual charges and benefit-cost ratio for the desired 12-foot channel computed as claimed by local interests are as follows:

Benefits:	
From reduction in cost of receiving 9,800 tons of coal by barge at $0.855/ton	$ 8,400
From reduced maintenance due to relocation of channel	1,200
From reduced tidal delay on pig iron and sand barges in 8.5-foot channel	1,000
	$10,600
Annual Charges:	$13,400
Benefit-Cost Ratio:	0.8 to 1

34. If, as a comparison of freight rates indicates, no coal will be received by barge, the benefit-cost ratio would be:

Benefits:	
From reduced maintenance	$ 1,200
From reduced tidal delay	1,000
	$ 2,200
Annual Charges:	$13,400
Benefit-Cost Ratio:	0.2 to 1

35. The benefit-cost ratio for the desired deepening of the channel to 12 feet as indicated above is less than unity under the most optimistic conditions.

PROPOSED LOCAL COOPERATION AND ALLOCATION OF COST

36. If the desired improvement were warranted, some measure of local cooperation would be required, including a cash contribution toward the cost of realignment of the channel nearer to the Malleable Iron Fittings Company wharf. That company has stated that it would contribute $10,000 toward the cost of improvement. However, due to the extremely low benefit-cost ratio, no allocation of cost has been made.

COORDINATION WITH OTHER AGENCIES

37. All Federal, State and local agencies having interests in the desired improvement were notified of the public hearing and subsequent discussions have been held with State and local interests. The U. S. Coast Guard furnished detailed information concerning navigation aids.

DISCUSSION

38. Branford Harbor, on Long Island Sound about five miles east of New Haven Harbor, Connecticut, is a small harbor extensively used for recreational boating. The existing Federal project provides for a channel 8.5 feet deep, 100 feet wide to the upper wharf in the river at Branford.

39. Work on this survey report was initiated in 1945. A hearing was held at Branford on December 13, 1945, at which time local interests desired modification of the existing project to provide for a 12-foot channel and a 6-acre anchorage for recreational craft. In September 1955, a trustee of the Branford Yacht Club, which originally requested the anchorage in 1945, stated in a letter to the Division Engineer that the improvement was no longer needed because the Yacht Club and other interests had dredged part of the area and constructed marinas and other facilities. To permit commercial use of the harbor as well as provide for the deeper draft recreational craft he desired that the existing project be maintained.

40. In October 1955, the Branford Board of Selectmen was requested to advise as to the present attitude of the Town toward the desired recreational improvement. No reply has been received. As the Yacht Club has indicated that modification of the existing project for recreational craft is no longer desired and local Town officials have made no comments, a plan of improvement for recreational navigation is not considered necessary at this time.

41. The desired plan of improvement for commercial navigation consists of deepening the existing 8.5-foot channel to 12 feet to permit barges drawing up to 14 feet to bring coal to the Malleable

Iron Fittings Company from New Jersey ports. The company receives coal by rail and claimed that if the channel were deepened, the company would receive about 9,800 tons of coal annually by barge at a saving in transportation and handling costs of $0.855/ton.

42. Up to 1948, the company received pig iron and sand by barge. This traffic ceased because of shoaling in the channel, but it is presumed that when the maintenance dredging now underway is completed, this commerce will be resumed, and since there would be a tidal delay expense in the existing channel which the desired 12-foot channel would eliminate, there would be a benefit to this traffic of about $1,000 annually. The company stated that realignment of the channel closer to their wharf would eliminate an annual expense of $1,180 for maintenance dredging between their wharf and the channel.

43. A study of freight rates for coal shipments to Branford indicates that rail shipment of coal is cheaper than barge shipment, and it is considered that the company probably would not change its method of shipment.

44. The benefit-cost ratio for the desired 12-foot channel would be 0.8 to 1 if the benefits claimed by local interests could be realized. It is more probable that the major part of the benefits claimed could not be realized, and the benefit-cost ratio would be 0.2 to 1. In either case, the benefits are insufficient to justify the desired improvement.

45. In October 1955, the Malleable Iron Fittings Company was informed that the improvement did not appear to be warranted, and their comments were invited. No reply has been received.

CONCLUSION

46. Local interests have indicated that no improvement for recreational navigation is needed and there seems to be no possibility that the Town of Branford would be willing to contribute at this time toward the cost of a recreational improvement. Although local interests desire deepening of the existing channel to 12 feet, reasonably prospective commerce would not provide sufficient benefits to justify the improvement. It is considered that reducing the project depth to 7.5 feet in the channel through the shoal in the inner harbor as recommended by the 1916 survey report is no longer desirable. For these reasons, it is concluded that no modification of the existing project should be made at this time.

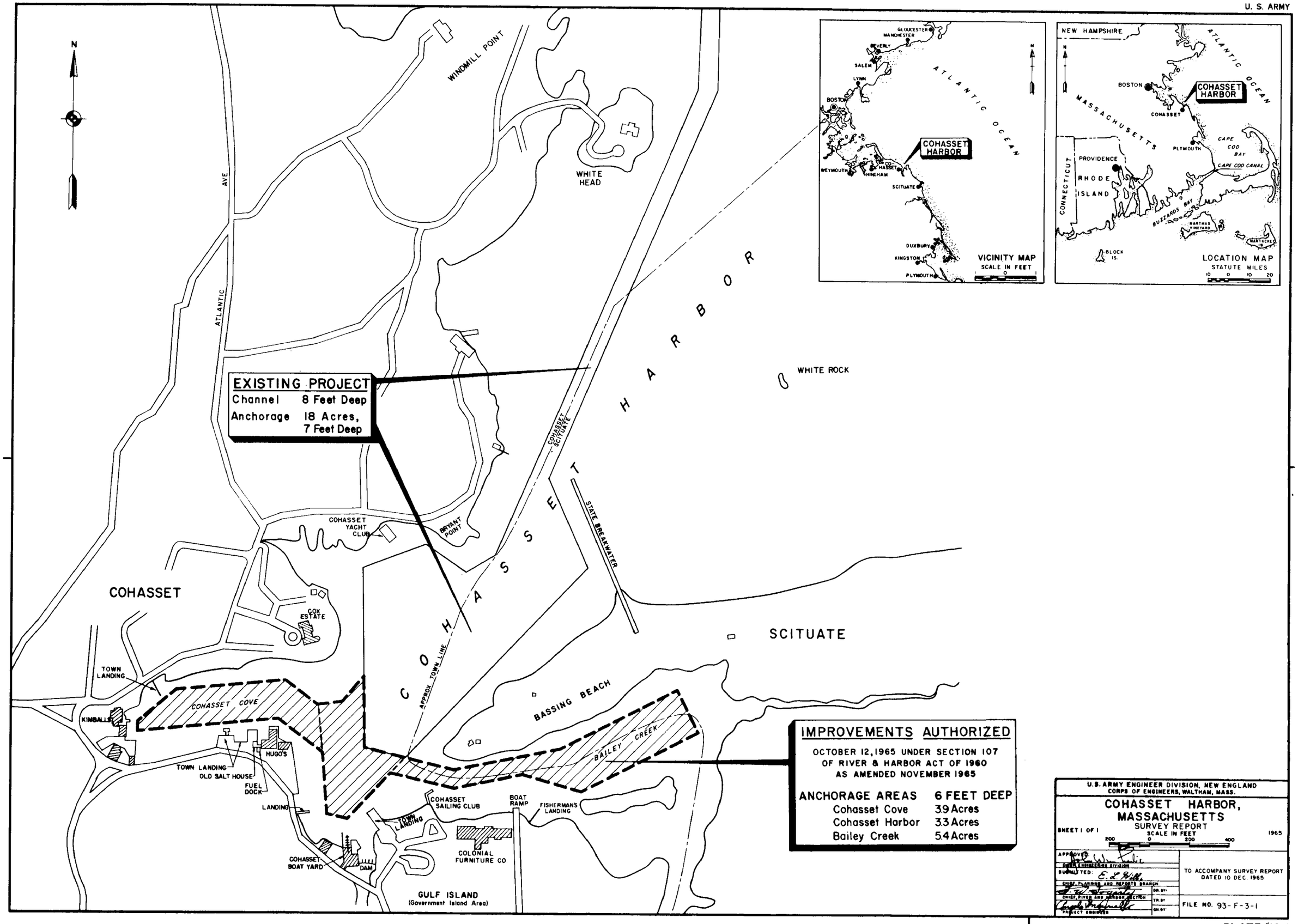
RECOMMENDATION

47. The Division Engineer recommends that no modification be made in the existing project for Branford Harbor.

ROBERT J. FLEMING, JR.
Brigadier General, USA
Division Engineer

CORPS OF ENGINEERS

U. S. ARMY



IMPROVEMENTS AUTHORIZED

OCTOBER 12, 1965 UNDER SECTION 107
OF RIVER & HARBOR ACT OF 1960
AS AMENDED NOVEMBER 1965

ANCHORAGE AREAS	6 FEET DEEP
Cohasset Cove	3.9 Acres
Cohasset Harbor	3.3 Acres
Bailey Creek	5.4 Acres

U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS, WALTHAM, MASS.

COHASSET HARBOR, MASSACHUSETTS

SURVEY REPORT

SHEET 1 OF 1

SCALE IN FEET
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1965

APPROVED:
CHIEF, ENGINEERING DIVISION

SUBMITTED: E. L. Gill
CHIEF, PLANNING AND REPORTS BRANCH

CHIEF, RIVER AND HARBOR SECTION

PROJECT ENGINEER

DR. BY:
TR. BY
CH. BY:

TO ACCOMPANY SURVEY REPORT
DATED 10 DEC. 1965

FILE NO. 93-F-3-1

PLATE NO. 1